

Running Head: Open Educational Resources

OPEN EDUCATIONAL RESOURCES:

Leveraging the opportunity of laptops for open education in Maine

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### ABSTRACT

Open educational resources are part of a global movement to make education available to all. Schools are implementing open courses and providing open educational resources to various kinds of learners. Teachers need professional development to create, identify, and implement open educational resources. In order for the open educational movement to thrive, professional development, sustainability, funding, copyright, and quality control need to be considered.

**Introduction:**

What if every citizen of the world with access to a computer and a network could receive a quality education for free? The movement to open education to all is spearheaded by the creation and use of open educational resources (OERs). The term was first used at a UNESCO conference in 2002. The complete definition is “The open provision of educational resources, enabled by information and communication technologies, for consultation, use, and adaptation by a community of users for non-commercial purposes.” (Hylén, p. 1, 2006). The concept is timely in education, with the right to education acknowledged as a global human right by the United Nations in 1948 as a part of the Universal Declaration of Human Rights (see Appendix A). The trend to develop, organize, and share open educational resources in order to fulfill this right and enlighten the populace and therefore alleviate human suffering is worthy of research.

The positive implications of the open educational movement in Maine school systems begin with the wide array of free materials that open educational resources represent. Teachers in underfunded districts can use OERs immediately in the classroom and receive professional development as a result of OERs designed for them. With training and shared knowledge of how open education works, there is the potential for reduced costs for textbooks, increased knowledge of standards-based curriculum design, and creative integration of technology, pedagogy, content, and knowledge (Koehler & Mishra, 2008). Dynamic collegial growth is just one possible outcome. In addition, when OERs are identified, they can provide educators with an immediate toolkit to augment the laptop initiative beyond word

processing and searches. According to the Maine Learning Technology Initiative's (MLTI) official site (2010), 100% of Maine public middle schools are currently with a 1 pupil to one computer ratio, or 1 : 1. 55% of Maine public high schools participate in the laptop initiative. A lease on 100,00 machines occurred in 2009, and as of 2010, 64,000 computers had been ordered and given to students (Maine Learning Technology Initiative, 2010). Those numbers suggest that digital resources are at a maximum leverage point for learners. Open educational resources should flourish in such an environment.

### **Synthesis**

The literature was chosen for this review to provide a definition of open educational resources and a historical context for the OER movement. Some of the studies were case studies involving integration of OER into k-12 schools or universities. In addition, barriers and limitations to OER were addressed. There is exploration of what is needed to support the OER movement in education including funding, sustainability, quality control, copyright, and professional development surrounding frameworks for identifying and using open educational resources.

As a whole, the studies focused on what OER can do to leverage a learning community and the basic human right to be educated. Most researchers agreed that open educational resources are, as Koehler and Mishra (2008) defined on page 10, a “wicked problem”, first defined by Rittel & Webber in 1973 as types of problems that have incomplete, contradictory, and changing requirements. To expand on why this definition helps to frame open educational resources: There is no

governing OER board, or any one organization that represents the OER movement. There are issues with creation, identification, and alignment to various standards. There is clear evidence that open educational resources are not free, and teachers do not magically know what to do with them: they must be introduced to the type of open educational resources (OER), of which there exist multiple types. Simply put, there is no easy way to go about adopting an open educational movement in a school system. There are no clear solutions to the issues of copyright, quality control, or basic organization and structure of repositories. The work of OER implementation is not easy, cheap, free, or rapid. However, the results of solving the problem of implementing open educational resources are seen as having great social benefit.

Almost every study concluded that teachers need more professional development in order to fully harness the power of open educational resources. Understanding what they are, how to design and create them, how to use and manipulate them, and how to identify already-existing OERs falls squarely on the shoulders of educators and not technology specialists or administrators, because they are not the ones who will use them in daily practice. If anything, the role of technology specialists and administrators is to allow time for teachers to explore OERs and integrate them, as well as time to share the process with others. An underlying trust that the teacher is using the resource appropriately aligned to state standards is also necessary. Not having teacher buy-in was shown as a limitation for OERs, as the case study by Schuwer & Mulder (2009), done on open education in the Netherlands, reveals: “Some schools hesitated to cooperate in this experiment

because of the busy agendas of the staff with no room for new activities” (p. 70).

Any time a district adopts a new initiative, it is implied that the stakeholders will receive training and support.

Four of the studies were direct initiatives to create and integrate open educational resources. The study by Thrakrar, Zinn, & Wolfenden (2009) focused on a consortium, with funding by the Hewlett Foundation, that developed a bank of open educational resources for teacher education in Sub-Saharan Africa. With an estimation of 4 million teachers needed by 2015 (as cited on p. 2), the concept of OERs was determined to meet a need for school-based teacher professional development. The research was conducted by examining the different types of OERs that were available and grouping them as “highly structured, loosely structured, and guided use” (p. 4). The research addressed teacher interaction with the OERs and the impact on practice. According to the authors (Thrakrar, Zinn, & Wolfenden, 2009), 200,000 teachers are expected to engage with the OER training as of 2009. The limitation revealed by the study is not unusual for the circumstances. They noted: “Teacher motivation, aspiration, and morale are important contextual factors”—in this case the conditions for teachers including emergency, crisis, and post-conflict situations (p. 2).

Conditions in the Netherlands were the basis for the study done by Schruwer & Mulder (2009). In this study, data was examined from surveys given to 2000 users of an open educational system. The motivation for such a system was to attract life-long learners and those who were not on traditional pathways. One of

the outcomes was a clear framework for developing open educational resources, by means of converting distance learning courses into more open courseware. This framework revealed that intellectual property, or copyright, is a major challenge of developing OERs and subsequently, a copyright “expert” was determined necessary to validate the resource as open. The results of the experiment showed almost a million unique hits to the site, after launching in 2006, with 90,000 returning to use the resources.

One of the major influences that the copyright dilemma had on the initial experiment (which started with three courses and has now grown to 24 offered openly) was that from that point forward, open courses had to be under a Creative Commons copyright (see Appendix B). This type of copyright appeared in three of the studies and appeared as a standard in the open educational resource movement, as noted in the research done by Lane (2009), Caswell, Henson, Jensen, & Wiley (2008), and Hylén (2006).

The Dutch experiment was a positive one and as a result, the awareness of open educational resources and their potential for Dutch people to access education non-traditionally seems to relate to what open educational resources can do for Maine people. The idea presented to create an “OER expert scenario” (p. 76) in which Dutch educators position themselves as educational experts and market themselves to the secondary schools in the Netherlands could benefit Maine teachers who adopt that strategy. Maine educators could position themselves as experts and with the networks and hardware already in place, lead other states by

sharing how to use open educational resources in one to one environments. In addition, the Dutch model of converting all educational components in the public school system to open components which can be accessed by anyone seems like a viable strategy for education for all, especially in a state like Maine, where isolation sometimes prevents learners from achieving higher levels of education.

Another positive outcome examined by Petrides & Jimes (2008) was the process of a group of volunteers in South Africa who produced a free, online science textbook for high school students in the country. A clear framework for creating an open educational resource that is unrestricted was given. The idea that the process of creating these texts is an ongoing, fluid process reminds me of Koehler & Mishra's wicked problem again, and the authors found that sustainability is a key issue with the project. The research was conducted via phone interview with three founders and one face-to-face interview. This type of narrative seemed appropriate as research because of the unique perspectives of the insiders on the project. One of the strongest outcomes was determining the importance of standards-aligned, peer-produced content (Petrides & Jimes, 2008). In addition, the authors found that the project members had "willingness to continually reassess its practices and processes" (p.5) thereby addressing the need to create a dynamic solution for the user. In addition, content management systems were developed and implemented with templates that enabled volunteers to contribute to the textbooks in a usable way. The templates were designed for users to submit, share, and revise text, activities and illustrations in personal workspaces. Teachers did not have to worry



about designing the workspace, but were free to focus on the content and standards alignment.

Quality control makes an appearance in the study. How did the project maintain quality control? Petrides & Jimes (2008) found that two full rounds of editing and revising by South African science teachers were required for the content to pass into open status (p.7). This type of rigor attributed to the creation of open educational resources should also apply to reviewing already existing digital resources. Simply looking up a science website online and using it to teach a lesson is not the point of an open educational resource. It should align with content standards.

In Wilson's (2008) study, open educational resources are considered for two vastly different countries in the form of OpenLearn, a content management system developed by the Hewlett Foundation to adapt distance-learning modules to open courses. Schools in the United Kingdom are compared to schools in South Africa, via interviews with senior professors of those schools about OER initiatives. With this study, the moral imperative for teachers to openly share knowledge is the underlying purpose for developing the initiative. The study revealed that open educational resources are not free, nor are they easy, to produce (Wilson, p. 5). In addition, the researchers concluded that set-up, continued support, storage, and keeping the content updated was not cheap. The study was done in the early stages of the OpenLearn content development and was part of a larger study involving 12 representatives from 11 institutions. Without much information on the

launch and usage of the OERs at the two schools, it seemed that much more data was needed to see the implications of the project, including whether or not learners really used the open educational resources at their disposal, and whether or not teachers were given support and training for an OER movement.

Designing open educational resources was mentioned in at least three of the studies. Caswell, Henson, Jensen, & Wiley (2008) defined something called OpenCourseWare as “a digital collection of freely available educational materials organized as courses” (p. 3). The study shared data from the many schools and universities that employ OpenCourseWare as OERs. It also suggests that schools who want to offer OpenCourseWare can often integrate it into existing systems (p. 7). Marketing was mentioned in terms of sharing OERs as a positive, humanitarian ideal that is attractive to those paying tuition. Copyright was discussed as being a challenge. Sustainability and funding were also noted as issues for schools considering an OER move. On page 9 the authors revealed that the Hewlett Foundation has donated over 40 million dollars to the development of OERs.

Conole and Weber (2008) focused their research on the need of a “learning design tool” for open educational resources (p. 2). They claimed that the lack of uptake for the OER concept (a concept that is designed for social benefit) is due in part to a lack of design skills by teachers. The authors used 44 case studies to make their arguments. The tool that they proposed was called a “Learning Design Toolbox” (p.2) in which a wide range of tools and resources are collated to provide support and guidance for designers and teachers. It could be replaced by cloud computing

services such as Google, which is technically a learning implementation tool. In other words a savvy teacher does not need the learning tool the authors propose, but a series of tools that are already available for free. Professional development is needed in either scenario. What is essential in both scenarios is a formalized learning design methodology, perhaps similar to what the South African text book research revealed—a template for the flow of creation and implementation of open educational resources that are aligned to standards. Conole and Weber (2008) suggested on page 12 that a formal methodology might “enable better creation and reuse” of OERs.

Creative materials were the subject of the study done by Teczi, Karaca, & Sezginsoy (2008). Their study is a little outside the realm of open educational resources but relates to the design of OERs, something that has been established as important to the mission. The authors created a scale based on the responses of 112 specialists of material development and creativity—professors of technology development, i.e., content for the masses. The results were organized into a checklist encompassing audio-visual items, content, language and expression, operating and mechanism, form, and color. Developers are able to use this checklist when creating content. This seems valuable to open educational development and is included for that reason.

Fulantelli, Gentile, and Taibi (2009) provided a reality to the open educational movement that seems unavoidable. The amount of content that is open and available does not always refer to a specific educational context or “the didactic

process” (p. 2), essentially meaning open educational resources are not found in educational realms, or designed by teachers, or exist as a result of educational research. Some open educational resources are websites that exist apart from education, but can be identified as a learning object. This is why it is important, for the Maine study, to align open educational resources to the Maine Learning Results as a part of the initial framework. This particular study again referred to the design of a learning management system by presenting a model of what an open educational movement needs in essence. It dealt with the same issues as other studies: the need to clarify copyright and the need for quality control. The study concluded that open educational resources are “evolving resources and not final products” (p. 9) which reminded me of Koehler and Mishra’s wicked problem referred to in the introduction. One very intriguing idea proposed in the study is the inclusion of students in the design process.

Caswell, Henson, & Jensen (2009) and Lane (2009) dealt with similar themes of content identification outside a clear educational realm online, or learning management systems that organize content with educational design, copyright issues, sustainability issues, and barriers beyond open education. This last theme seems timely for Maine students who have been exposed to technology via the Maine Laptop Initiative. The accessibility gap is narrowing as more and more students and teachers connect.

The themes in the literature included the need for professional development in the design and management of open educational resources. The right to

education for all also implies that teachers need professional learning time to prepare for education for all. Teachers also need to be trained to evaluate copyright and quality control, especially in the beginning stages of designing an open educational component for a set group of learners. If open educational resources are to impact Maine education over the long term, all of these factors need to be addressed by a core group of dedicated people, including administrators, technology support staff (both hardware and software), teachers, and educational technicians.

## **Conclusion**

An initial study of open educational resources for Maine education could introduce the concept to key stakeholders, the teachers. Potential OERs could be put through a rigorous review process, which would define the type of OER, align the OER to standards, identify the target grade to use the OER, and even include which level of Bloom's taxonomy is being used when engaged with the OER. These resources, free, open, shareable, could become the basis for a Maine OER teaching and learning community. What if all the teachers in Maine understood the potential of open educational resources and began to design with and create learning objects that benefited everybody? Maine is a state of isolated communities with shrinking populations. It seems imperative to consider the open educational movement as a positive educational trend, with the benefits far outweighing the challenges of implementation.

Why does it matter to continue this research that has stretched across the globe and permeates some of the nation's finest institutes of higher learning?

Beyond the moral imperative, open educational resources could reduce marginalization by market forces of learning experiences (think outdated textbooks that have cost a significant percentage of dwindling educational budgets), engage educators in more powerful research, impact generations of learners, including perhaps those who have taken an alternate learning path. Maine educators are in a unique position to leverage the OER movement by partnering with the laptop initiative that has put computers and networks into schools across the state. Teachers are able to connect with each other and with learners, reducing the inequities inherent to poor, isolated districts. The problem in Maine is learning how to use the hardware and networks to maximum learning opportunities (no more outdated textbooks). The purpose of a Maine OER study would be to create a core community that promotes open, quality education for all that is aligned to state standards, identifies open copyright sources, and trains teachers how to integrate these sources. How can educators partner together to identify open educational resources, as well as implement the professional development required for open education to work? As the studies showed, there are many elements needed for success, none more essential than willing participants to do the work required of initiating, developing, and sustaining learning content that is appropriate to the time and space of learners.

**Methods**

There are many teachers and students in Maine equipped with hardware (computers) and networks (broadband internet access). Navigating the vast array of resources available online can be time-consuming and ineffectual. The purpose of the study is to identify open educational resources that can be utilized to fit the curricular needs of Maine teachers. How can Maine educators identify open educational resources and share them in an effective way?

**Site**

The data for this study will come from a team of 9 teacher researchers in the content area of World Languages. The research will be conducted in an on-line format. The team of researchers represents the nine superintendent regions of Maine. The team leader (principal investigator) will organize the research cohort members, establish meeting times and goals, and communicate with Syntiro, the agency in Readfield, Maine, charged with managing the grant paying the teacher researchers.

**Subjects**

The teacher researchers will review a minimum of 100 websites. The sites will be chosen by the team based on use of the websites in current practice, i.e., sites that the teachers use anyway to support teaching and learning. An initial survey

(using Google forms) will be given to collect the URLs of each site before the study begins.

### **Instrumentation**

The websites will go through two reviews. There is an initial review (Appendix C), and a secondary review process (Appendix D). The reviews are set up as on-line surveys that teacher researchers will complete while reviewing a potential open educational resource. The surveys are on Google forms so that results can be shared easily between researchers in an online format. The review and peer review instruments were designed based on initial discussions by team leaders. Questions asked when designing the surveys included what is the definition of an open educational resource, what are the standards used for each content area, and what other factors need to be considered, including copyright, content strand, grade cluster, type of activity, and Bloom's Taxonomy.

### **Procedure**

Teacher researchers will work asynchronously to review websites, for consideration of open educational resource status. The team leader will organize collected data and interpret the results to share with other content area teams and to disseminate to the World Language teachers of Maine through sharing at professional conferences such as FLAME, ACTEM, and MLTI. The teams will be established in April 2010, and will continue to meet in an on-line setting for a period of 14 months. Through these on-line meetings, teacher researchers will discuss the process and potential outcomes as well as share best practice and usage of the



reviewed sites. In order to do the site reviews, teacher researchers will need Internet access and Google accounts. In order to participate in online meetings, participants will use Skype and Google applications. A Google calendar will be kept at the main website organizing the research (Appendix E). The lead teacher (Amity Beane) will assume all content management and will include links to all instruments, results, and meeting summaries.

The process of identifying websites for review, doing an initial candidate review to ascertain openness, and the peer review, will be done using Google applications. Forms will be used to collect data, and spreadsheets will be used to interpret data (Appendix C and D) . Summaries in graph form will also be used to analyze the website reviews and to identify gaps. The team leader, Amity Beane, will work with the Syntiro organization technology team to interpret and present results of the study.

### **Data analysis**

The data organization will be by content area strand (World Language strands include Community, Culture, Communication, Connections, Community), Maine Learning Result indicator, open educational resource type, grade span, language, copyright, and accessibility. The sites that meet all the criteria of an open educational resource will then be tagged in Delicious under the Syntiro username (Appendix F). Results will be shared in a summary report provided by the team leader that will share an overview, a summary of the review process including the

peer review, links to the project website, and spotlight narratives of particularly useful resources as identified by the researchers.

The timeline for completing this study will be from April 2010 to June 2011. The funding will occur in two phases, running from April 2010 to November 2010, and December 2010 to June 2011. Teacher researchers will meet at least five times in phase 1, and at least three times in Phase 2. A retreat is planned for January 2011 to review data and meet face to face. The projected outcome for the end of Phase 2 is to have identified over one hundred open educational resources by the World Language Research Cohort led by Amity Beane. These will be posted to Delicious (Appendix F) as well as in a stand-alone list (Appendix G). These resources will exist for Maine World Language teachers to use in conjunction with the laptop initiative.

Concurrent with this study done by World Language teachers will be similar studies in other content areas including Math, Career, Health, and the Arts. The resulting data can be found on the Syntiro Delicious site (Appendix F).

### **Limitations**

The study is limited in that the sites chosen for review come out of the experience of only nine teachers in the state of Maine. While all are World Language teachers, a greater number of teachers providing baseline data would garner different results. Several studies could be done over time to close gaps and more teachers could provide a greater number of identified open educational resources. The concept of identifying and sharing sites can be replicated any number of times

and can provide greater and deeper knowledge about teaching with open educational resources.

### Reference List

- Caswell, T., Henson, S., & Jensen, M. (2008). Open Education Resources: Enabling universal education. *International Review of Research in Open and Distance Learning*, 9, 1-10. Retrieved October 1, 2010 from ERIC educational database.
- Conole, G., & Weller, M. (2008). Using learning design as a framework for supporting the design and reuse of OER. *Journal of Interactive Media in Education*, 5, 1-13. Retrieved October 1, 2010 from EBSCOHost educational database.
- Fulantelli, G., Gentile, M., & Taibi, D. (2008). The Open Learning Object model to promote Open Educational Resources. *Journal of Interactive Media in Education*, 9, 1-11. Retrieved October 1, 2010 from ERIC educational database.
- Hylén, J. (2006). Open educational resources: Opportunities and challenges. *OECD-CERI*. Retrieved October 1 from <http://oecd.org/edu/oeri>.
- Koehler, M., & Mishra, P., (2008). Introducing TPACK. In AACTE Committee on Innovation and Technology (Eds.) *Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators*. New York: Routledge.
- Lane, A.(2009) The impact of opened on bridging educational digital divides. *International Review of Research in Open and Distance Learning*, 10, 1-12. Retrieved October 1, 2010 from ERIC educational database.

Maine Learning Technology Initiative (2010). *About MLTI*, retrieved from <http://maine.gov/mlti/about/index.shtml>

Petrides, L., & Jimes, C. (2008). Building Open Educational Resources from the ground up: South Africa's free high school science texts. *Journal of Interactive Media in Education*, 7, 1-16. Retrieved October 1, 2010 from ERIC educational database.

Schuwer, R., & Mulder, F. (2009). OpenER, a Dutch initiative in Open Educational Resources. *Open Learning*, 24, 67-76.

Tezci, E., Karaca, D., & Sezginsoy, B. (2008). The study of reliability and validity of creative materials. *The Turkish Online Journal of Educational Technology*, 7 (1) art. 5. Retrieved October 1, 2008 from ERIC educational database.

Thakrar, J., Zinn, D., & Wolfenden, F. (2009). Harnessing Open Educational Resources to the challenges of teacher education in Sub-Saharan Africa. *International Review of Research in Open and Distance Learning*, 10, 1-15. Retrieved October 1, 2010 from ERIC educational database.

Wilson, T. (2008). New ways of mediating learning: Investigating the implications of adopting open educational resources for tertiary education at an institution in the United Kingdom as compared to one in South Africa. *International Review of Research in Open and Distance Learning*, 9, 1-19. Retrieved October 1, 2010 from ERIC educational database.

## **Appendices**

### Appendix A

<http://www.un.org/Overview/rights.html>

### Appendix B

<http://creativecommons.org/about/licenses/>

### Appendix C

<http://tinyurl.com/389azyv>

(Candidate Review)

### Appendix D

<http://tinyurl.com/2cmkl7w>

(Peer Review)

### Appendix E

<http://sites.google.com/site/maineworldlanguages/>

### Appendix F

<http://www.delicious.com/syntiromsn>

### Appendix G

<http://tinyurl.com/35cvj4p>

(Master List)